

a.) Amendments to the Claims

1. (Canceled)

2. (Currently Amended) A process for producing guanosine 5'-diphosphate-fucose ("GDP-fucose"), comprising:

allowing a guanosine 5'-triphosphate ("GTP") precursor, a saccharide selected from the group consisting of glucose, fructose and mannose, and enzyme sources to be present in an aqueous medium, wherein the enzyme sources are (i) a culture ~~broth~~ of a microorganism capable of forming GTP from said GTP precursor or a treated product of the culture ~~broth~~, and (ii) a culture ~~broth~~ of a microorganism capable of forming guanosine 5'-diphosphate-4-keto-6-deoxymannose ("GKDM") from said saccharide and GTP or a treated product of the culture ~~broth~~;

forming and accumulating GKDM in the aqueous medium; and then
~~converting the accumulated GKDM into guanosine 5'-diphosphate-fucose ("GDP-fucose") using, as an enzyme source, adding~~ a culture ~~broth~~ of a microorganism capable of converting GKDM into GDP-fucose or a treated product of the ~~culture broth~~ to ~~form and accumulate GDP-fucose in culture, as an enzyme source, to~~ the aqueous medium to convert the accumulated GKDM into GDP-fucose; and

forming and accumulating GDP-fucose in the aqueous medium; and
recovering the GDP-fucose from the aqueous medium,
wherein the treated products of the culture ~~broth~~ are treated products independently selected from the group consisting of a concentrated product of the culture ~~broth~~, a dried product of the culture ~~broth~~, cells obtained by centrifuging the culture ~~broth~~, a dried product of the cells, a freeze-dried product of the cells, a surfactant-treated product

of the cells, a solvent-treated product of the cells, an enzyme-treated product of the cells and an immobilized product of the cells.

Claims 3-8 (Cancelled).

9. (Original) The process according to claim 2, wherein the GTP precursor is selected from the group consisting of guanine, xanthine, hypoxanthine, guanosine, xanthosine, inosine, guanosine 5'-monophosphate, xanthosine 5'-monophosphate, and inosine 5'-monophosphate.

Claim 10 (Cancelled).

11. (Previously Presented) The process according to claim 2, wherein the microorganism capable of forming GTP from a GTP precursor belongs to the genus *Corynebacterium*.

12. (Original) The process according to claim 11, wherein the microorganism is *Corynebacterium ammoniagenes*.

13. (Currently Amended) The process according to claim 2, wherein the microorganism capable of forming GKDM from a saccharide selected from the group consisting of glucose, fructose and mannose, and GTP is one or more strains of microorganisms.

14. (Previously Presented) The process according to claim 13, wherein the one or more strains of microorganisms are selected from the genera *Escherichia* and *Corynebacterium*.

15. (Original) The process according to claim 14, wherein the microorganism belonging to the genus *Escherichia* is *Escherichia coli*.

16. (Original) The process according to claim 14, wherein the microorganism belonging to the genus *Corynebacterium* is *Corynebacterium ammoniagenes*.

17. (Currently Amended) The process according to claim 2, wherein the microorganism capable of forming GKDM from a saccharide selected from the group consisting of glucose, fructose and mannose, and GTP has a strong activity of at least one enzyme selected from the group consisting of glucokinase ("*glk*"), phosphomannomutase ("*manB*"), mannose 1-phosphate guanylyltransferase ("*manC*"), phosphoglucomutase ("*pgm*"), phosphofructokinase ("*pfk*"), and GDP-mannose 4,6-dehydratase ("*gmd*").

18. (Currently Amended) The process according to claim 17, wherein the microorganism is at least one microorganism having a recombinant DNA comprising a vector and a DNA fragment containing at least one gene selected from the group consisting of a *glk*-encoding gene, a *manB*-encoding gene, a *manC*-encoding gene, ~~a *pgm*-encoding a~~ *pgm*-encoding gene, a *pfk*-encoding gene, and a *gmd*-encoding gene.

19. (Previously Presented) The process according to claim 18, wherein at least one of the *glk*-encoding gene, the *manB*-encoding gene, the *manC*-encoding gene, the *pgm*-encoding gene, the *pfk*-encoding gene or the *gmd*-encoding gene is derived from *Escherichia coli*.

20. (Previously Presented) The process according to claim 2, wherein the microorganism capable of converting GKDM into GDP-fucose has strong GKDM epimerase/reductase ("*wcaG*") activity.

21. (Previously Presented) The process according to claim 20, wherein the microorganism has a recombinant DNA comprising a vector and a DNA fragment containing a *wcaG*-encoding gene.

22. (Original) The process according to claim 21, wherein the *wcaG*-encoding gene is derived from *Escherichia coli*.

Claims 23-34 (Cancelled).

35. (Currently Amended) A process for producing guanosine 5'-diphospho-fucose ("GDP-fucose"), comprising:

allowing a guanosine 5'-triphosphate ("GTP"), a saccharide selected from the group consisting of glucose, fructose and mannose, and an enzyme source to be present in an aqueous medium, wherein the enzyme source is a culture ~~broth~~ of a microorganism capable of forming guanosine 5'-diphosphate-4-keto-6-deoxymannose

("GKDM") ~~from a saccharide~~ from said saccharide and GTP or a treated product of the culture ~~broth~~;

forming and accumulating GKDM in the aqueous medium; and then
~~converting the accumulated GKDM into GDP-fucose using, as an~~
~~enzyme source, adding~~ a culture ~~broth~~ of a microorganism capable of converting GKDM
into GDP-fucose or a treated product of the ~~culture broth~~; culture, as an enzyme source, to
the aqueous medium to convert the accumulated GKDM into GDP-fucose;

forming and accumulating GDP-fucose in the aqueous medium; and
recovering the GDP-fucose from the aqueous medium,

wherein the treated products of the culture ~~broth~~ are treated products
independently selected from the group consisting of a concentrated product of the culture
~~broth~~, a dried product of the culture ~~broth~~, cells obtained by centrifuging the culture ~~broth~~,
a dried product of the cells, a freeze-dried product of the cells, a surfactant-treated product
of the cells, a solvent-treated product of the cells, an enzyme-treated product of the cells
and an immobilized product of the cells.

Claim 36 (Cancelled).

37. (Currently Amended) The process according to claim 35, wherein the
microorganism capable of forming GKDM from a saccharide selected from the group
consisting of glucose, fructose and mannose, and GTP is at least one kind of
microorganisms.

38. (Previously Presented) The process according to claim 37, wherein the

at least one kind of microorganisms is at least one microorganism selected from microorganisms belonging to the genera *Escherichia* and *Corynebacterium*.

39. (Previously Presented) The process according to claim 38, wherein the microorganism belonging to the genus *Escherichia* is *Escherichia coli*.

40. (Previously Presented) The process according to claim 38, wherein the microorganism belonging to the genus *Corynebacterium* is *Corynebacterium ammoniagenes*.

41. (Currently Amended) The process according to claim 35, wherein the microorganism capable of forming GKDM from a saccharide selected from the group consisting of glucose, fructose and mannose, and GTP is a microorganism having a strong activity of at least one enzyme selected from the group consisting of glucokinase ("*glk*"), phosphomannomutase ("*manB*"), mannose 1-phosphate guanylyltransferase ("*manC*"), phosphoglucomutase ("*pgm*"), phosphofructokinase ("*pfk*") and GDP-mannose 4,6-dehydratase ("*gmd*").

42. (New) The process according to claim 41, wherein the microorganism is at least one microorganism having a recombinant DNA comprising a vector and a DNA fragment containing at least one gene selected from the group consisting of *glk*-encoding gene, a *manB*-encoding gene, a *manC*-encoding gene, a *pgm*-encoding gene, a *pfk*-encoding gene, and a *gmd*-encoding gene.

43. (New) The process according to claim 42, wherein at least one of the *glk*-encoding gene, the *manB*-encoding gene, the *manC*-encoding gene, the *pgm*-encoding gene, the *pfk*-encoding gene or the *gmd*-encoding gene is derived from *Escherichia coli*.

44. (New) The process according to claim 35, wherein the microorganism capable of converting GKDM into GDP-fucose has strong GKDM epimerase/reductase (“*wcaG*”) activity.

45. (New) The process according to claim 44, wherein the microorganism has a recombinant DNA comprising a vector and a DNA fragment containing a *wcaG*-encoding gene.

46. (New) The process according to claim 45, wherein the *wcaG*-encoding gene is derived from *Escherichia coli*.